

WHAT IS CLAIMED IS:

1. A method of forming a semiconductor device, comprising:
 - forming a cavity in a body of a substrate, the body having a bottom surface and a top surface, the cavity opening onto at least the bottom surface;
 - at least partially filling the cavity with at least one material having a greater thermal conductivity than the body; and
 - forming a semiconductor over the top surface.
2. The method of claim 1, wherein forming the cavity comprises forming a cavity in a sapphire body.
3. The method of claim 1, wherein forming the cavity comprises ablating the body with a laser.
4. The method of claim 1, wherein forming the cavity comprises ablating the body with an Nd:YAG laser.
5. The method of claim 1, wherein forming the cavity comprises ablating the body with a laser having a spot size of at least about 20 μm .
6. The method of claim 1, wherein forming the semiconductor comprises forming a GaN semiconductor structure.
7. The method of claim 1 wherein at least partially filling the cavity comprises at least partially filling the cavity with at least one of a seed layer, Au, Ag or Cu.
8. The method of claim 1, wherein at least partially filling the cavity comprises:
 - forming a seed layer on at least a portion of the inner surface of the cavity; and
 - forming an additional at least one material layer in the cavity over the seed layers.
9. The method of claim 8, wherein forming an additional at least one material layer comprises plating the additional at least one material onto the seed layer.

10. The method of claim 1, wherein at least partially filling the cavity comprises at least partially filling the cavity with a metal paste.

11. The method of claim 1, wherein forming the semiconductor occurs after forming the cavity.

12. The method of claim 11, wherein:

the body has a thickness; and

forming the cavity comprises forming the cavity to a depth that is less than the thickness of the body so that the cavity opens only onto the bottom surface.

13. The method of claim 11, wherein:

the body has a thickness; and

forming the cavity comprises forming the cavity to a depth that is less than the thickness of the body so that the cavity opens only onto the bottom surface.

14. The method of claim 13, wherein forming the cavity comprises forming at least a first portion having a first depth that is less than the thickness of the body and a second portion having a second depth that is less than the thickness of the body, but greater than the first depth.

15. The method of claim 1, wherein forming the semiconductor occurs prior to forming the cavity.

16. The method of claim 15, wherein:

the body has a thickness;

forming the cavity comprises forming the cavity to a depth that is equal to the thickness of the body so that the cavity opens onto the bottom surface and the top surface; at least partially filling the cavity comprises at least partially filling the cavity so that the at least one material contacts the semiconductor.

17. The method of claim 15, wherein:

forming the cavity comprises forming at least a first portion having a first depth that is less than the thickness of the body and a second portion having a second depth that is equal to the thickness of the body, so that the cavity opens onto the bottom surface and the top surface; and

at least partially filling the cavity comprises at least partially filling the cavity so that the at least one material contacts the semiconductor.